



Colegio de San Juan de Letran
Dominican Avenue, Abucay, Bataan
Library and Media Services

RESEARCH GUIDE:

SIGNAL, SPECTRA, AND SIGNAL PROCESSING

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RESEARCH GUIDES

SIGNALS, SPECTRA, AND SIGNAL PROCESSING

I. SCOPE NOTE

Signal is an electrical or electromagnetic current that is used for carrying data from one device or network to another. [techopedia](#). Spectra, an array of entities, as light waves or particles, ordered in accordance with the magnitudes of a common physical property, as wavelength or mass. [dictionary.com](#). Signal processing, The processing of signals by means of hardwired or programmable devices, the signals being regarded as continuous or discrete and being approximated by analog or digital devices accordingly. [encyclopedia.com](#)

II. SEARCH AIDS (BT: Broader Term, RT: Related Term, NT: Narrow Term)

BT:

- Signals
- Spectra
- Signal processing

RT:

- Digital signal processors
- Fourier transforms
- Spectrum analysis
- Z transform
- Convolution
- Filters
- Random signal analysis
- Correlation functions
- Classification of signals
- Characteristics of signals
- Sampling theorem
- Aliasing

NT:

- FIR and IIR filters
- Pole-zero-gain filters
- Signal towers
- Audio processing
- Compression
- Echo cancellation
- Adaptive filtering
- Random variables
- Central limit theorem
- Continuous time signal
- Discrete time signal

- Analog signal
- Digital signal
- Periodic signal
- Aperiodic signal
- Deterministic signal
- Random signal
- Causal signal
- Anticausal signal
- Non causal signal
- Energy signal
- Power signal
- Neither energy nor power signal
- Waveform

III. INFORMATION RESOURCES

A. LIBRARY RESOURCES

Note: For the appropriate access credentials, please contact the Letran Bataan Library

➤ E-JOURNALS

- Compel. https://www.proquest.com/central/publication/publications_31712
- Measurement Science Review.
https://www.proquest.com/central/publication/publications_2026594
- Measurement Techniques.
https://www.proquest.com/central/publication/publications_54071
- Applied Sciences.
https://www.proquest.com/central/publication/publications_2032433
- Journal of Mathematical Chemistry.
https://www.proquest.com/central/publication/publications_2043851
- IEEE Sensors Journal.
https://www.proquest.com/central/publication/publications_75733
- Journal of Physics: Conference Series.
https://www.proquest.com/central/publication/publications_4998668
- Proceedings of the Institution of Mechanical Engineers: Journal of Automobile Engineering, Part D.
https://www.proquest.com/central/publication/publications_37561
- IEEE Signal Processing Letters.
https://www.proquest.com/central/publication/publications_75747
- IEEE Transactions on Image Processing.
https://www.proquest.com/central/publication/publications_85429
- IEEE Transactions on Information Forensics and Security.
https://www.proquest.com/central/publication/publications_85506
- International Journal of Antennas and Propagation.
https://www.proquest.com/central/publication/publications_237281

- Journal of Electrical and Computer Engineering.
https://search.proquest.com/central/publication/publications_237792
- IEEE Transactions on Instrumentations and Measurements.
https://search.proquest.com/central/publication/publications_85462
- International Journal of Image, Graphics, and Signal Processing.
https://search.proquest.com/central/publication/publications_2026669
- International Journal of Electrical Engineering & Education.
https://search.proquest.com/central/publication/publications_37651
- Measurement Science Review.
https://search.proquest.com/central/publication/publications_2026594

➤ E-THESES

- Golipour, L. (2006). On cochlea signal processing: Auditory spectrum, cochlea frequency selectivity, and masking property (Order No. MR15281). Available from ProQuest Central. (304974902). Retrieved from <https://www.proquest.com/dissertations-theses/on-cochlea-signal-processing-auditory-spectrum/docview/304974902/se-2?accountid=190548>
- Shaban, M. (2016). Low complexity sub-nyquist spectrum sensing for wideband cognitive radios (Order No. 10003781). Available from ProQuest Central. (1761840915). Retrieved from <https://www.proquest.com/dissertations-theses/low-complexity-sub-nyquist-spectrum-sensing/docview/1761840915/se-2?accountid=190548>
- Louis, S. (2020). Development of a spectrum analyzer using a spin torque nano-oscillator (Order No. 27994787). Available from ProQuest Central. (2466059585). Retrieved from <https://www.proquest.com/dissertations-theses/development-spectrum-analyzer-using-spin-torque/docview/2466059585/se-2?accountid=190548>
- Hou, S. (2014). Spectrum sensing and kernel-based machine learning in cognitive radio network: Algorithms and data processing (Order No. 3673015). Available from ProQuest Central. (1652489096). Retrieved from <https://www.proquest.com/dissertations-theses/spectrum-sensing-kernel-based-machine-learning/docview/1652489096/se-2?accountid=190548>
- Yu, T. (2011). Microphone array signal processing for advancements in robust speech systems (Order No. 3450507). Available from ProQuest Central. (864739096). Retrieved from <https://www.proquest.com/dissertations-theses/microphone-array-signal-processing-advancements/docview/864739096/se-2?accountid=190548>
- Pritchard, K. M. (2020). Signal processing, performance metrics, and lifetime of a ${}^6\text{LiF:ZnS}(\text{ag})$ neutron detector with WLS fibers and SiPM photodetector (Order No. 28095667). Available from ProQuest Central. (2477875675). Retrieved from <https://www.proquest.com/dissertations-theses/signal-processing-performance-metrics-lifetime/docview/2477875675/se-2?accountid=190548>
- Wu, X. (2011). High-speed optical signal processing and performance monitoring towards Tbit/s optical networks (Order No. 3487958). Available from ProQuest Central. (913576571). Retrieved from <https://search.proquest.com/docview/913576571?accountid=190548>
- Feltane, A. (2016). Time-frequency based methods for nonstationary signal analysis with application to EEG signals (Order No. 10102283). Available from ProQuest Central.

(1785854476). Retrieved from

<https://search.proquest.com/docview/1785854476?accountid=190548>

- Varma, R. A. (2020). Exploiting structure in data: Sampling and signal processing on graphs (Order No. 27739115). Available from ProQuest Central. (2381675250). Retrieved from <https://search.proquest.com/docview/2381675250?accountid=190548>
- Liu, W. (2018). Multirate frequency transformations: Wideband AM-FM demodulation with applications to signal processing and communications (Order No. 10839620). Available from ProQuest Central. (2117205087). Retrieved from <https://search.proquest.com/docview/2117205087?accountid=190548>
- He, X. (2014). MIMO digital signal processing in few-mode fiber optical communication systems (Order No. 3687684). Available from ProQuest Central. (1669973344). Retrieved from <https://search.proquest.com/docview/1669973344?accountid=190548>

B. OPEN ACCESS

➤ FREE E-BOOKS

- Lyons, Richard G. (2014). The essential guide to digital signal processing. New Jersey: Prentice Hall. <https://www.pdfdrive.com/the-essential-guide-to-digital-signalprocessing-d189140568.html>
- Giron – Sierra, Jose Maria. (2017). Digital Signal Processing with Matlab Examples, Volume 1 Signals and Data, Filtering, Non-stationary Signals, Modulation. New York: Springer. <https://www.pdfdrive.com/digital-signal-processing-with-matlab-examplesvolume-1-signals-and-data-filtering-non-stationary-signals-modulationd158167171.html>
- Corinthios, Michael. (2009). Signals, systems, transforms, and digital signal processing with MATLAB. Boca Raton: CRC Press Taylor & Francis. <https://www.pdfdrive.com/signals-systems-transforms-and-digital-signal-processingwith-matlab-d188098282.html>
- Blanchet, Gérard. (2006). Digital signal and image processing using Matlab. United Kingdom: iSTE. <https://www.pdfdrive.com/digital-signal-and-image-processing-usingmatlab-d51889369.html>

➤ FREE E-JOURNALS

- Signal Processing. <https://www.sciencedirect.com/journal/signal-processing>
- IEEE Open Journal of Signal Processing. <https://signalprocessingsociety.org/publications-resources/ieee-open-journal-signal-processing/about-open-journal-signal-processing>
- Signal Processing Open Access Journals. <https://www.springeropen.com/p/engineering/signal-processing-journals>
- EURASIP Journal on Advances in Signal Processing. <https://asp-urasipjournals.springeropen.com/>
- International Journal of Signal Processing. <https://www.iaras.org/iaras/journals/ijsip>
- International Journal of Signal and Imaging Systems Engineering. <https://www.inderscience.com/jhome.php?code=ijsise>

- Signal Processing Open Access Articles. <https://www.journals.elsevier.com/signalprocessing/open-access-articles>
- Signals. <https://www.mdpi.com/journal/signals>
- Digital Signal Processing – Open Access Journal. <https://www.longdom.org/peerreviewed-journals/digital-signal-processing--scholarly-journals-1698.html>
- Journal on Advances in Signal Processing. <https://aspeurasipjournals.springeropen.com/time-frequency-signal-analysis>
- International Journal of Signal and Imaging Systems Engineering. <https://www.inderscience.com/jhome.php?jcode=ijsise>

➤ FREE E-THESES

- Lipton, J. M. (2021). Frequency spectra of chaotic systems: theory and applications. (Thesis). Monash University. Retrieved from <https://doi.org/10.26180/14969334.v1>
- Payne, T. G. (2011). Profiling the metabolome using Fourier transform ion cyclotron resonance mass spectrometry, optimised signal processing, noise filtering and constraints methods. (Doctoral Dissertation). University of Birmingham. Retrieved from <https://ethos.bl.uk/OrderDetails.do?uin=uk.bl.ethos.535362>
- Pelan, J. D. (2016). Modular Multi-Signal Tracking Pulse Descriptor Word (PDW) Generator WithField Programmable Gate Array (FPGA) Implementation. (Masters Thesis). Wright State University. Retrieved from http://rave.ohiolink.edu/etdc/view?acc_num=wright1472223866
- Rachid, M. (2013). Filtering by Aliasing and its application to Reconfigurable Filtering and Compressive Signal Acquisition. (Thesis). UCLA. Retrieved from <http://www.escholarship.org/uc/item/0f62t5gm>
- Sugavaneswaran, L. (2021). Signal Analysis In The Ambiguity Domain. (Thesis). Ryerson University. Retrieved from <http://hdl.handle.net/10.32920/ryerson.14663475.v1>
- Chua, K. C. (2010). Analysis of cardiac and epileptic signals using higher order spectra. (Thesis). Queensland University of Technology. Retrieved from <https://eprints.qut.edu.au/39236/>
- Shao, W. (2013). Radar signal representation and classification. (Doctoral Dissertation). University of Wollongong. Retrieved from <https://ro.uow.edu.au/theses/3891>
- Randhawa, G. S. (2020). Machine Learning with Digital Signal Processing for Rapid and Accurate Alignment-Free Genome Analysis: From Methodological Design to a Covid-19 Case Study. (Thesis). University of Western Ontario. Retrieved from <https://ir.lib.uwo.ca/etd/7007>
- Kong, T. W. (2019). Assessing self-similarity in redundant complex and quaternion wavelet domains: Theory and applications. (Doctoral Dissertation). Georgia Tech. Retrieved from <http://hdl.handle.net/1853/61244>

C. PROFESSIONAL ORGANIZATIONS

- IEEE Signal Processing Society. <https://signalprocessingsociety.org/>
- European Association for Signal Processing. <https://www.erasip.org/>
- The Institution of Engineering & Technology. <https://www.theiet.org/>

- International Association of Engineers. <http://www.iaeng.org/ISEE.html>
- Institution of Electrical & Electronics Engineer. <https://www.ieee.org/>

D. OTHER RELATED WEB PORTALS

- A Pragmatic* Introduction to Signal Processing. <https://terpconnect.umd.edu/~toh/spectrum/>
- Nature Communications. <https://www.nature.com/articles/s41467-020-17119-2>
- Signal Processing Toolbox. <https://www.mathworks.com/products/signal.html>
- Docsity. <https://www.docsity.com/en/signal-spectra-and-signal-processing-2/4250750/>
- Nature Communications. <https://www.nature.com/articles/s41467-020-17119-2>
- NASA Science. https://science.nasa.gov/ems/01_intro

E. RELATED RESEARCH GUIDES

- Alfaisal University Library. <https://libguides.alfaisal.edu/c.php?g=607216&p=4210296>
- University of Arkansas. <https://uark.libguides.com/c.php?g=78850&p=505535>
- Ohio Northern University. <https://library.onu.edu/electromagnetics>
- Virginia Tech. <https://vtechworks.lib.vt.edu/handle/10919/84164>

IV. TUTORIALS

- Allen Downey - Introduction to Digital Signal Processing - PyCon 2018. https://www.youtube.com/watch?v=HJ_-5mqUZ70
- Digital Signal Processing (DSP) Tutorial - DSP with the Fast Fourier Transform Algorithm. https://www.youtube.com/watch?v=HJ_-5mqUZ70
- How to do Spectral analysis or FFT of Signal in Python? <https://www.youtube.com/watch?v=UjUKaQKnILM>
- MATLAB and Simulink Training. <https://www.mathworks.com/learn/tutorials/signal-processing-onramp.html>
- Introduction to Signal Processing. <https://www.youtube.com/watch?v=YmSvQe2FDKs>
- Signal Processing with MATLAB. <https://www.youtube.com/watch?v=sCZLJsi6-FA>
- Signal Analysis Made Easy. <https://www.youtube.com/watch?v=9aTuzwYJI8g>
- Signal Processing Onramp. <https://au.mathworks.com/learn/tutorials/signal-processing-onramp.html>
- Spectral Analysis with MATLAB. <https://www.youtube.com/watch?v=qrU2jsSqWD8>
- Real-time Signal Processing and Analysis on Measurement Data. https://www.youtube.com/watch?v=xMWIATas_e0

Prepared by:

Mr. Marvin A. Milla

Layout

mamilla@letranbataan.edu.ph



Ms. Maria Rosiel C. Ordenes

Subject Librarian

mrcordenes@letranbataan.edu.ph

Asst. Prof. Norady Mercado Pere

Chief Librarian

ndmercado@letranbataan.edu.ph

For more inquiries, kindly e-mail us at library@letranbataan.edu.ph

